DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 16, 1995

MEMORANDUM FOR: G. W. Cunningham, Technical Director

COPIES: Board Members

FROM: J. Deplitch

SUBJECT: Report on INEL Emergency Response Exercise "Varmint"

1. **Purpose:** This report documents Defense Nuclear Facilities Safety Board's (Board) staff observations made during the conduct of the 1995 Performance Test of the Department of Energy's (DOE) Emergency Management System. Performance Test "Varmint" was an exercise conducted on September 13, 1995, for the Idaho National Engineering Laboratory (INEL) Advanced Test Reactor (ATR). Board staff observers were J. Deplitch, D. Thompson, and R. Zavadoski.

2. **Summary:** DOE terminated the planned six hour exercise after two and a half hours. DOE has not announced the reason for the early termination. The DOE emergency response organizations demonstrated the activation of operations and coordination centers. The emergency response organizations could only partially demonstrate their procedures and the availability and use of required emergency response equipment and resources. Offsite activities were just activating when the exercise terminated. Approximately fifty percent of the 161 exercise objectives were performed; predominantly notification and facility activation-related objectives. The exercise did not demonstrate dose assessments, offsite protective actions, detailed technical assessments, shift turnover, and interactions between the DOE Headquarters (DOE-HQ) Emergency Operations Center (EOC) and the joint DOE Idaho Operations Office (DOE-ID) and INEL EOC. Overall, the Board staff observers considered that DOE did not demonstrate its ability to respond to an emergency, due to the omission of key objectives for protecting the health and safety of the public.

3. **Background:** Performance Test "Varmint" was an emergency preparedness and response exercise conducted by DOE, Office of Emergency Management, NN-60, to demonstrate the ability to integrate and coordinate emergency response actions involving DOE, DOE contractors, and offsite agencies during an emergency at INEL.

   The ATR-simulated accident scenario was played real time at the ATR Training Simulator with an exercise crew of reactor operators. ATR plant conditions were displayed to the exercise crew as if the actual accident sequence was occurring. All exercise accident response occurred at the ATR Building and associated areas. The exercise included: loss of commercial power, backup emergency diesel generator failure, loss of coolant flow, ATR fuel damage (10-15%), radioactive effluent release (up to 700 Ci/sec), contamination, two casualties, and a fatality.

4. Discussion/Observations:

Board staff observed activities of exercise conduct and control, and activities at the accident scene, incident command post (ICP), Test Reactor Area (TRA) Emergency Coordination Center (ECC), joint DOE-ID and INEL EOC, INEL Public Information Center, and DOE-HQ EOC. DOE and INEL performed timely notifications, activated EOCs and ECCs, were responding to and evaluating the accident, and practiced many exercise procedures. TRA and Chemical Processing Plant (CPP) accounted for and evacuated workers; Central Facility Area (CFA) accounted for and sheltered its workers. DOE-HQ EOC activated its Emergency Management Team (EMT).

INEL had recently significantly revised its emergency response procedures and developed emergency action level (EAL) procedures. The procedures were a good framework, but required further development, particularly the EAL procedures. For many possible accidents or incidents there were no provisions for a General Emergency or even a Site Area Emergency in some cases, when the provisions were obviously warranted. INEL personnel did not believe the conditions for the emergency were credible. For example, there was no provision for a General Emergency for the accident scenario of this exercise, even though DOE had projected 5 rem at the site boundary in the planning for this exercise.

Declaring an emergency took too long. Within five minutes the accident conditions were clearly understood: no coolant flow, 10-15% fuel damage, and loss of confinement. No Alert was declared. In accordance with draft INEL EAL procedures, a Site Area Emergency was not declared for more than 30 minutes. Timely declaration of the appropriate emergency level is essential to taking necessary protective actions for the health and safety of the workers and the public.

No dose or consequence assessment was completed and no offsite protective action recommendations were made during the exercise. The two and a half hour exercise provided adequate information to complete consequence assessment and dose projections and make some timely protective action recommendations. Additionally, the Atmospheric Release Advisory Capability (ARAC) provided an unlabeled five hour plume dose projection that was unused, because no one understood it.

Radiological practices during the exercise demonstrated a lack of understanding of, or discipline for, operating in radiation fields and contamination control. First, the responders monitored casualties and the exercise controllers provided casualty contamination monitoring readings directly outside the ATR building where the dose rate was 20-30 mrem/hour (factor of 10 or more higher than contamination levels). Second, the responders did not take measures to minimize their exposure. The On-Scene Commander responded to and operated around the ATR building for nearly an hour with no radiological protective equipment. The responders remained and operated in the radiation area longer than necessary. They did not appear aware of the

radiation field. Monitoring of dose rates and exposures was not observed. Third, measures to control the responders' contamination was poor. No hotline or step-off pad was established. Responders were frisked for radiological contamination in the 5-10 mrem/hour radiation field at the ICP. Responders performed undressing without due care for contamination. Also, the ATR reactor operators had no self contained breathing apparatus available.

There were no apparent fixed radiological monitors outside the ATR building. Fixed exterior monitors (a common commercial practice) could provide valuable radiological data for the protection of workers and emergency responders in the TRA. Fixed monitors on buildings and at the boundary of the TRA could reduce the requirement for resultant field surveys and field survey team exposures, focus field surveys on the most important and more difficult locations, and collect radiological data more efficiently and more timely for dose assessments.